APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,124	08/16/2001	Takahiko Kishi	678-724 (P9876)	3618

7590 01/10/2006	EXAMINER	
Paul J. Farrell, Esq.	ZHENG, EVA Y	
DILWORTH & BARRESE, LLP	ART UNIT	PAPER NUMBER
333 Earle Ovington Blvd.	2634	
Uniondale, NY 11553		

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>31 October 2005</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-19</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-9 and 16-19</u> is/are rejected.
7)☒ Claim(s) <u>10-15</u> is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☑ All b)☐ Some * c)☐ None of:
      1.☑ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1.   The request filed on October 31, 2005, for a Request for Continued Examination

(RCE) under 37 CFR 1.114 based on parent Application No. 09/931,124 is acceptable

and a RCE has been established. An action on the RCE follows.

Claim Objections

2.   Claim 5 is objected to because of the following informalities: the order of receiver

components in claim 5 is unclear and awkward. It should be consistent with Fig. 2.

Appropriate correction is required.

3.   Claim 14 is objected to because it is exactly same or a duplication of claim 13.

Appropriate correction is required.

4.   Claim 15 is objected to because it is exactly same or a duplication of claim 12.

Appropriate correction is required.

5.   Claim 19 is objected to of the following informalities: on line 2, recitation: two

decimation filter" should be changed to -- two decimation filters --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly
claiming the subject matter which the applicant regards as his invention.

7.   Claim 16 is rejected under 35 U.S.C. 112, second paragraph. Claim 16 recites

the limitation "the digital signal" in line 5. There is insufficient antecedent basis for this

limitation in the claim.

8.   Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

       Regarding to claim 19, the functionality of a selector is unclear and confusing.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 1, 5, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Chalmers (US 5,375,146) in view of Lovinggood et al. (US 6,697,603).

a)   Regarding to claim 1, Chalmers disclose a digital down-converter for converting a

frequency of a signal, received at a radio receiver and sampled with a radio frequency

(RF) or an intermediate frequency (IF), to a detection frequency for a detection process,

comprising:

       a first mixer (106 in Fig. 1) for converting and outputting a frequency of the

received signal to a frequency of a first IF signal by multiplying the signal by a real

signal;

a decimation filter (inherent as IF filter 108 in Fig. 1) for suppressing unwanted

components among the frequency of the first IF signal from the first mixer (Col 1, L49-

51); and

a second mixer (112 in Fig. 1) for converting the frequency of the first IF signal

having only wanted components outputted by the decimation filter to a second IF signal

of the detection frequency, and outputting the second IF signal as a complex signal by

multiplying the output of the decimation filter by a complex local signal (126 and output

of 132,134 as shown in Fig. 1).

Chalmers disclose all the subject matters described above except for the specific

teaching of a digital signal input for down converting. However, Lovinggood et al., in the

same field of endeavor, teaches A/D converter (420) output to a digital down converter

(as shown in Fig. 3). Moreover, Chalmers states that variation of different conversion

stages is well known (Col 1, L48-50). Therefore, it is obvious to one of ordinary skill in

art to apply the A/D converter of Lovinggood et al. before the digital frequency

downconversion in Chalmers' system. By doing so, provide simpler digital down

converter design and more desirable result.

b)   Regarding to claim 5, Chalmers disclose a receiver comprising:

a digital down-converter including a first mixer (106 in Fig. 1) for converting a

frequency of the received signal, sampled with a radio frequency (RF) or an

intermediate frequency (IF), to a frequency of a first IF signal by multiplying the signal

by a real signal (120), and a second mixer (112 in Fig. 1) for converting the first IF

signal converted by the first mixer to a second IF signal of the detection frequency for a

detection process and then outputting the second IF signal as a complex signal by

multiplying the first IF signal by a complex local signal (126 and output of 132,134 as

shown in Fig. 1).

a radio receiver (as shown in fig. 1) for receiving an input signal and providing the

received signal to the digital down-converter for frequency conversion;

A filter (102 in Fig.1) for attenuating an aliasing frequency component and an

image frequency component of the first mixer in the digital down-converter, from an

output of the radio receiver.

Chalmers disclose all the subject matters described above except for the specific

teaching of a digital signal input for down converting and an analog-to-digital converter

for sampling an output of the filter with a radio frequency or an intermediate frequency

and providing the sampled signal to the digital down-converter. However, Lovinggood et

al., in the same field of endeavor, teaches A/D converter (420) output to a digital down

converter (as shown in Fig. 3). Moreover, Chalmers states that variation of different

conversion stages is well known (Col 1, L48-50). Therefore, it is obvious to one of

ordinary skill in art to apply the A/D converter of Lovinggood et al. before the digital

frequency downconversion in Chalmers' system. By doing so, provide simpler digital

down converter design and more desirable result.

c)   Regarding to claim 16, Chalmers discloses a digital down-converter for

converting a frequency of a signal, received at a radio receiver and sampled with a radio

frequency (RF) or an intermediated frequency (1F), to a detection frequency for a

detection process, comprising:

a first mixer (106 in Fig. 1) for converting and outputting a frequency of the

received signal to frequency of a first IF signal by multiplying the signal by a real signal;

and

a second mixer (112 in Fig. 1) for dividing the frequency of the first IF signal into

a cosine part and a sine part (output of 132 and 134 in Fig. 1) and processing the

cosine part and the since part with a polyphase structure (220 in Fig. 2) for converting

and decoding to the frequency of a second IF signal by multiplying the first IF signal by

a complex local signal (126 and output of 132,134 as shown in Fig. 1).

Chalmers disclose all the subject matters described above except for the specific

teaching of a digital signal input for down converting. However, Lovinggood et al., in the

same field of endeavor, teaches A/D converter (420) output to a digital down converter

(as shown in Fig. 3). Moreover, Chalmers states that variation of different conversion

stages is well known (Col 1, L48-50). Therefore, it is obvious to one of ordinary skill in

art to apply the A/D converter of Lovinggood et al. before the digital frequency

downconversion in Chalmers' system. By doing so, provide simpler digital down

converter design and more desirable result.

11.   Claims 2-4, 6-9, 17 and 18 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Chalmers (US 5,375,146) in view of Lovinggood et al. (US

6,697,603), in further view of Ostman (US 6,061,385).

a)   Regarding to claims 2, 6, and 17, Chalmers and Lovinggood et al. disclose all of

the subject matter described above except for the specific teaching of a frequency of the

first IF signal is ¼ a sampling frequency.

Ostman, in same field of endeavor, teaches a received frequency modulated

signal as shown in Fig. 1, where the intermediated frequency is a quarter of the

sampling frequency (Col 4, L28-36).

To avoid complexity and extreme power consumption of the circuitry a well

known method is to select the intermediate frequency to be a quarter of the sampling

frequency (Ostman, Col 4, L28-35). Therefore, it is obvious to one of ordinary skill in

the art to implement quarter sampling method taught by Ostman in the frequency down

conversion system by Chalmers. By doing so, provide simpler digital down converter

design and more desirable result. Additionally, reduce power consumption, reduce cost,

and simplify communication system design.

b)   Regarding to claims 3, 7, and 18, Chalmers discloses the digital down-converter

as claimed in Claim 17, further comprising an automatic gain control (AGC) amplifier

(110 in Fig. 1) for amplifying of the output of the first mixer and inputting the amplified

output to the cosine part and the sine part of the second mixer.

c)   Regarding to claims 4 and 9, Chalmers discloses the digital down-converter,

wherein the second mixer further comprises a multiplier for multiplying the output of the

decimation filter by a certain ratio of a sampling frequency and a decoding means for

decoding the multiplied signal through the multiplier (as shown in Fig. 1).

d)   Regarding to claim 8, Lovinggood et al. disclose the receiver as claimed in claim

6, wherein the second mixer of the digital down-converter is constructed in a polyphase

structure comprised of a decimation filter and a quadrature converter (500 in Fig. 3).

Allowable Subject Matter

12.   Claims 10-13 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Eva Y Zheng whose telephone number is 571-272-

3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

<div style="text-align: right">

Eva Yi Zheng
Examiner
Art Unit 2634
</div>

January 5, 2006

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER